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***Fire Occurrence in the
Central Yukon Planning Area,
1956-1982***

by Melanie Miller



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1956 - 1982

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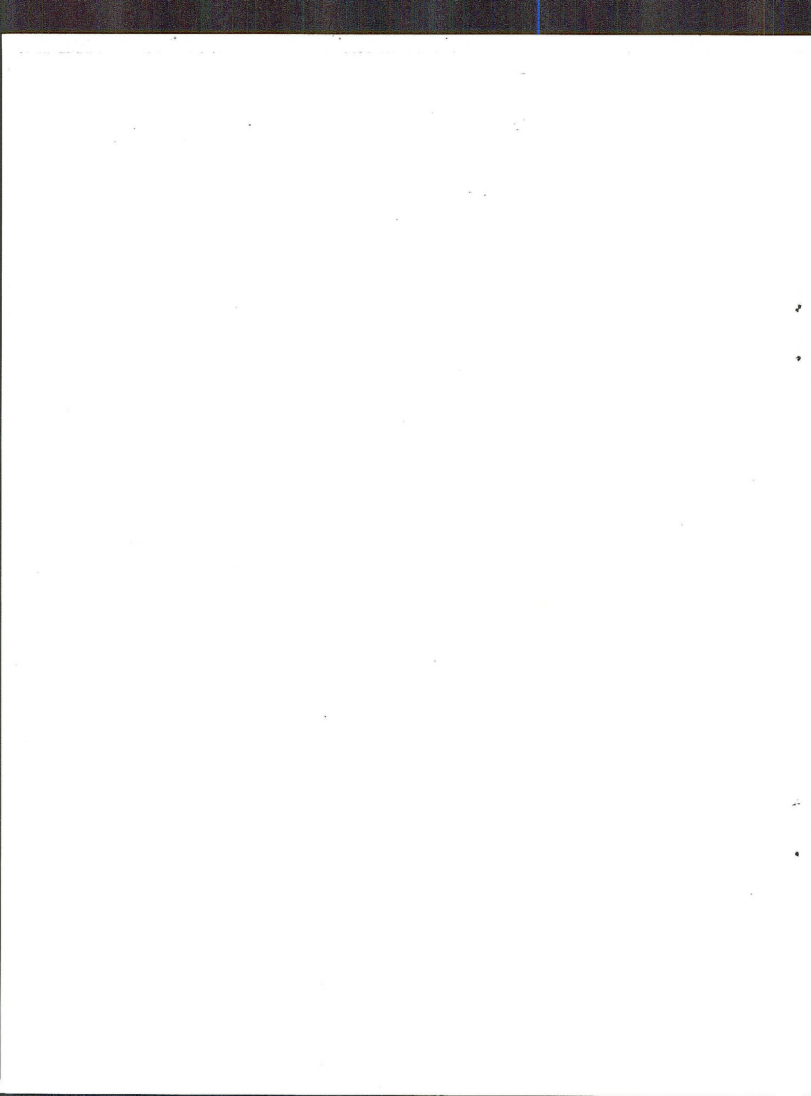
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FIRE OCCURRENCE IN THE CENTRAL YUKON PLANNING AREA
BLM ALASKA, FAIRBANKS DISTRICT
1956-1982

Melanie Miller, BLM, Northwest Resource Area, Fairbanks, Alaska

INTRODUCTION

The Central Yukon Planning Area (Fig. 1) is located in central Alaska. Wildfires have been a very common occurrence in this part of the state. An analysis of fire occurrence has been made for all BLM lands within this planning unit. Blocks of land are found in the eastern Nulato Hills; along the Dulbi River and in the Kaiyuh Mountains; along the central part of the Koyukuk River; in the Tozitna River drainage and Ray Mountains; and near the Chitanana and Nowitna Rivers and North Kuskokwim Mountains. Lands in the eastern portion of the Buckland Habitat Management Plan have been omitted from the East Nulato Hills subunit. Information for the Buckland HMP area has been analyzed and is included in a report on fire occurrence in the Northwest Planning Area (Miller, 1985).

The analysis is based upon two sources: computerized BLM fire records for 1956-1982 and all fire reports which were available for that period. Basic information from all fire reports is stored on the Honeywell 6600 computer at the USDI-Denver Service Center.

Fire information is fairly complete since the late 60's and early 70's and somewhat sketchy in earlier years, frequently because of low levels of fire detection in remote areas. Latitude and longitude were sometimes incorrectly noted on the original fire report, or miscoded. Fires may have been incorrectly located, and wrongly included in, or omitted from, the analysis. Locations for large fires were corrected, if maps were available. Significant information may have been lost, however, if the coordinates for large fires incorrectly place them outside of the areas for which statistics were obtained. These types of errors are more prevalent in the earlier years of record.

Fire mapping and fire size estimates, particularly for unmanned fires, are not always accurate. Many unmanned fires were mapped crudely, if at all, and burned acreage estimates were only a guess. Sometimes only the starting point was located. However, these records are the only information on past fire occurrence in west central Alaska.

The period of record is too short and the number of fires per subunit are usually too few to permit a statistically significant analysis of fire activity. Variable levels of detection and suppression and the nonhomogeneity of units in terms of topography and fuels further complicates the situation. Accurate fuels information cannot be obtained from fire reports. Fire weather and fire behavior is rarely noted. The analysis is therefore limited to a detailed compilation and calculation of information about fire occurrence. With locations, size, and year being the most important factors, a reasonable estimate of levels of fire activity can be made.

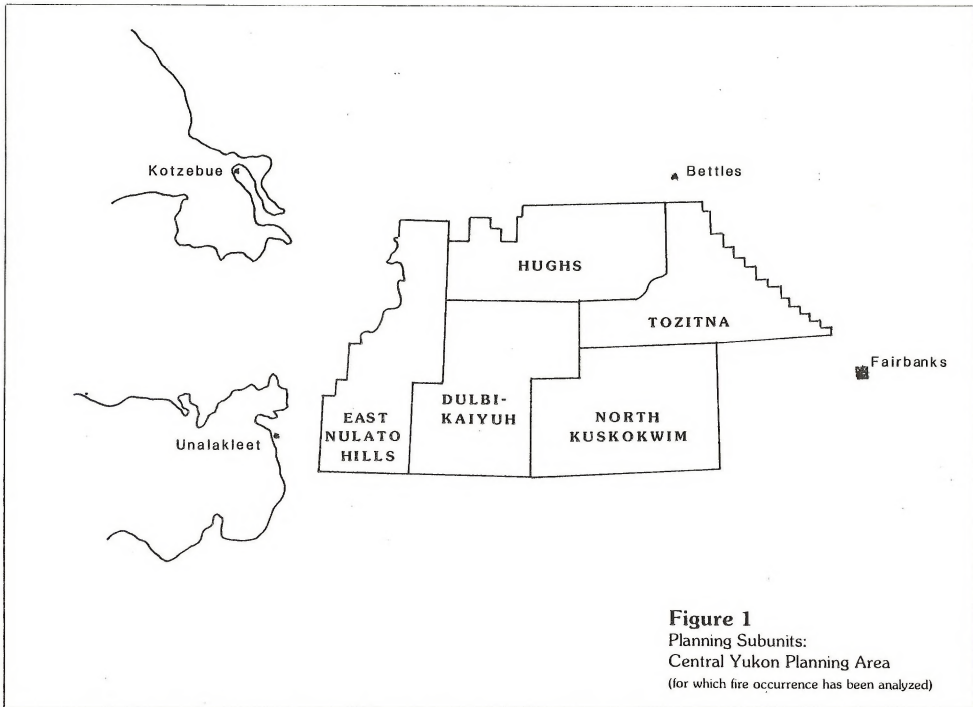


Figure 1
Planning Subunits:
Central Yukon Planning Area
(for which fire occurrence has been analyzed)

METHODS

Computerized fire records were obtained for rectangular blocks of land which included all areas of probable BLM ownership. Native and State selected lands were not included. Records corresponded to 1:250,000 scale map overlays showing location of fire start, fire size class, fire number, and year. All available fire reports for large fires were copied at the BLM State Office or Alaska Fire Service. However, records are incomplete for 1956 to 1961. Most fire reports for 1963 through 1968 cannot be located.

All available fire maps were copied onto 1:250,000 scale maps. Information for several large 1972 fires was obtained from 1973 Landsat scenes. The amount of burned acreage on BLM land was estimated for all large fires which started on, or burned onto, BLM land.

All fires on BLM land were listed for each subunit, combining information from all map quads for each area. A sequential listing for the period 1956-1982 was compiled. Fire number, fire name, date of origin, fire size class, acreage, cause, and cost were pulled from the computer printouts.

Fires were tallied by size class for each year and burned acreage and costs computed. The percent of fires which were lightning fires, percent of total area burned, average fire size, and number of fires per 100,000 acres was computed. Data was summarized by subunits and for the entire planning area.

Because fire control has limited the size of many fires, it is important to know which fires were not suppressed in order to draw some conclusions about the natural fire regime. The size of the suppression force was obtained from all available fire reports, and used as an estimate of the level of suppression effort. For those fires without fire reports, it was simply assumed that fires with costs at or near \$0 were not manned. This is a gross assumption because inaccurate coding of costs per fire has affected these figures, and costs for unmanned fires were sometimes inflated by expenses for aircraft patrol or retardant. It is likely that fewer were manned than summaries show.

The number of fires and burned acreage was listed by calendar date for the entire period of record for each subunit. Cumulative number and percent of starts and burned acres was calculated. The burned acreage figure can be misleading because the entire burned acreage for a particular fire is assigned to the date when the fire began. However, the dates when burned acreage actually occurred usually cannot be determined from fire reports. The dates recorded for fire containment and control only indicate when all fire activity was over.

From these cumulative summaries, the date when 60, 70, 80, and 90 percent of fires started, and the dates when the fires began which burned 60, 70, 80, and 90 percent of all burned acreage, were pulled. The dates of the earliest and latest fires were also noted for each subunit.

Yearly and total costs were converted to 1967 and 1982 dollars, using the Consumer Price Index, U.S. Cities Average (Appendix A). Average cost for all fires affecting the subunit was calculated. The 1957 cost adjustment factor was used to adjust 1956 figures because no factor has been calculated for 1956.

Total suppression cost per subunit does not give a good indication of the relative amount of fire suppression effort because subunit acreage and fire occurrence vary considerably. Also, total cost figures include expenditures for large fires which burned on both sides of the subunit boundary. It is frequently impossible to determine how many suppression dollars for a particular fire were spent within the subunit or on areas of the fire outside of the subunit. A cost per acre of subunit (total suppression dollars divided by subunit acres) can give a relative idea of suppression effort considering differences in subunit size, but must be adjusted to compensate for expenditures on some large fires. The estimated percent of fire acreage which burned within the subunit was calculated for each fire which burned across a subunit boundary. Then, the total cost for that fire was multiplied by the percent of acres which that fire burned within the subunit. These modified fire costs were used to adjust total fire costs per subunit, and used in calculation of average fire cost and cost per subunit acre.

INDIVIDUAL SUBUNIT SUMMARIES

East Nulato Hills

The East Nulato Hills subunit (2,492,800 acres) lies in the eastern half of the Nulato Hills, from about the 64th parallel, north to the Continental Divide (Figure 2). About 800,000 acres in the eastern portion of the Buckland HMP area are discussed in a separate report (Miller, 1985). A small block of land, 15 to 35 miles northeast of the subunit, was also omitted from this analysis. Thirty-five known fires, 30 lightning caused, burned about 31 percent of the subunit, a total burned acreage of about 780,951 acres (Table 1).

Fourteen fires were less than 10 acres, ten fires were between 10 and 100 acres, six fires ranged from 100 to 1,000 acres, these fires were 1,000 to 5,000 acres, and two fires greater than 5,000 acres affected the area (Table 2). Six fires were never manned (Appendix A).

Nine fires have started near the upper Unalakleet River, within about 12 miles of the southern boundary of the subunit. Only three fires were reported in the extensive uplands ranging from Debauch Mountain to Traverse Peak. Other fire starts were fairly evenly distributed in the rest of the subunit. Most fires have started between the second week of June and the end of July, with 14 fires in June and 17 in July. Large fires in 1957 started in mid-June, but were not declared out until September 10.

Fires have occurred in 13 of the past 27 years, with the most starts occurring in 1974. 99.2 percent of the total burned acreage, however, resulted from two 1957 fires which burned 774,400 acres in the subunit (Table 2). The 3,800 acres burned in 1968 was the second highest yearly total.

The 1957 Kateel River fire resulted from five fires which started on or about June 10, and eventually burned together (Appendix B). Covering a total of 1,161,200 acres, and 759,680 acres in the subunit, this was the largest fire in the state for which any definite record has been found. Because of

Figure 2
East Nulato Hills Subunit

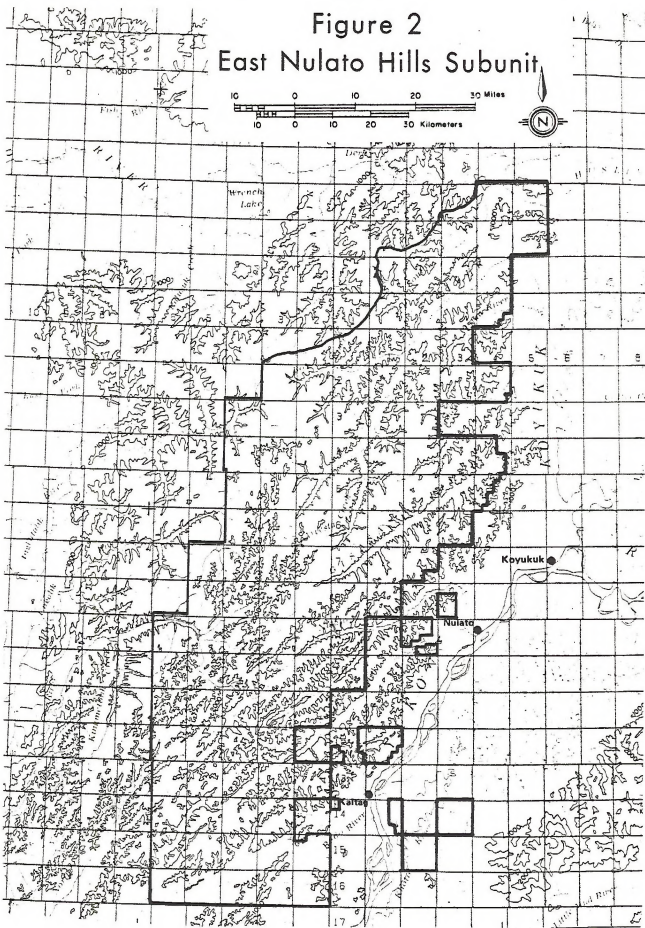


Table 1. FIRE OCCURRENCE: 1956-1982
 Central Yukon Planning Area
 EAST NULATO HILLS SUBUNIT

Fire No.	Name	Date	Size Class	Acres in Subunit	Cause	Total Suppression Force	Cost
67	S. Fork Nulato	6/14/57	G	14,720	Lightning	--	28,313
155	Kaltag	6/20/57	E	350	Recreation	--	5,275
98	Katal River	6/10/57	G	759,680	"	0	888
64	Ungalik River	6/06/58	E	700	"	0	163
20	Koyuk	5/18/60	C	40	Recreation	4	358
56	Traverse Peak	6/08/60	C	12	Lightning	--	2,209
134	Kateel River	7/24/60	B	1	"	--	603
143	Nulato	8/11/60	D	120	Misc.	--	12,528
73	Gisasa River	7/24/64	B	3	Lightning	--	1,160
53K	Unalakleet	6/29/65	C	25	"	--	1,757
Z90	7 Mile Isle	7/23/68	F	2,000	"	0	60
6D4	Stink Cr.	7/24/68	E	500	"	0	0
9D3	Unalakleet River	7/26/68	F	1,300	"	0	0
8666	Portage	7/07/72	B	3	"	--	884
8585	Dog	7/01/73	A	0*	"	--	162
8578	Kateel	6/20/74	B	1	"	8	13,369
8610	John	6/21/74	C	10	"	4	2,251
8611	Box	6/21/74	B	1	"	4	3,186
8618	Pitka	6/21/74	A	0	"	0	1,448
8844	Nulato	6/22/74	C	20	"	9	4,320
8841	Inuk	8/06/74	D	150	"	24	14,235
8560	Old Woman	6/14/76	F	1,000	"	76	104,392
8630	Unalakleet	7/13/76	B	8	"	8	16,033
8682	South Fork	7/16/77	B	1	"	2	0
8683	Gisasa	7/16/77	C	30	"	49	45,505
8759	South Fork	7/22/77	A	0	"	2	813
8782	Kalasiik	7/23/77	B	5	"	13	3,149
8812	Continental	7/23/77	B	8	"	6	1,954
8928	Ten Mile	8/03/77	C	25	"	14	11,966
8648	Nulato NW4	6/22/79	B	4	Misc.	12	6,938
8647	KAL NW 23	6/22/79	C	60	Misc.	15	21,105
8598	KAL NW 20	7/07/82	C	10	Lightning	25	33,179
8644	KAL SW 31	7/08/82	D	100	"	14	21,015
8645	KAL SW 32	7/08/82	C	60	"	10	7,405
8649	KAL NW 14	7/08/82	B	4	"	7	3,159

* Fires less 1/4 acre are recorded as 0 acres in the computerized fire statistics.

Table 2. FIRE STATISTICS SUMMARY: 1956-1982
Central Yukon Planning Area
EAST NULATO HILLS SUBUNIT

Year	Number of Fires	Number of Fires by Size Class*/ No. of Unmanned Fires								Acres in Subunit	Total Cost	Cost in 1967 Dollars	Cost in 1982 Dollars
		A	B	C	D	E	F	G	G**				
1956	0												
1957	3					1		2/1		774,750	34,476	40,897	118,233
1958	1					1/1				700	163	188	544
1959	0												
1960	4		1	2	1					173	15,698	17,698	51,165
1961	0												
1962	0												
1963	0												
1964	1		1							3	1,160	1,249	3,611
1965	1			1						25	757	801	2,316
1966	0												
1967	0												
1968	3					1/1	2/2			3,800	60	58	168
1969	0												
1970	0												
1971	0												
1972	1		1							3	884	706	2,041
1973	1		1							0	162	122	353
1974	6		1/1	2	2	1				182	20,254	13,713	39,644
1975	0												
1976	2			1				1		1,008	120,325	70,572	204,024
1977	6		1	3	2					69	63,387	34,924	100,965
1978	0												
1979	2			1	1					64	28,043	12,899	37,291
1980	0												
1981	0												
1982	4		1	2	1					174	64,758	22,400	64,758
Total	35		3	11	10	3	3	3	2	780,951		216,227	625,113
Unmanned	6		1	0	0	0	2	2	1				

* A = 0-0.25 acres, B = 0.26-9 acres, C = 10-99 acres, D = 100-299 acres, E = 300-999 acres, F = 1000-4999 acres, G = 5000+ acres.

** Fires greater than 5,000 acres which started outside the subunit boundary, but burned acreage within the subunit.

the remoteness of the area, only \$888 was spent, all for aerial observation. The South Fork Nulato fire started on June 14, 1957, and burned 14,720 acres of BLM land, out of a total of 40,000 acres. Some suppression action was taken to lessen the threat to the villages of Nulato and Kaltag.

Very little acreage has burned since 1957. The Kateel River fire covered a large proportion of the subunit acreage with high fire potential. Much of the remaining unburned area has very dissected topography, often with sparse fuels. Seven fires have started within the perimeter of the Kateel River fire, probably in unburned areas, but the largest was only ten acres. Flammability is increasing in that area, but fire potential is still fairly low, because much of the vegetation is in a young deciduous stage. Most unburned areas within the Kateel River fire are surrounded by burned land and/or natural barriers to fire spread.

Dulbi-Kaiyuh Subunit

The Dulbi-Kaiyuh Mountains subunit is two separate blocks of land which cover about 870,814 acres (Figure 3) in the central section of the planning area. About 175,000 acres are in the northern Kaiyuh Mountains, south of Galena. The Dulbi River block includes all the uplands drained by the Dulbi River, and part of the Bear Creek drainage east of Galena.

In the period 1956-1982, 64 fires burned in the subunit, 61 of which were lightning caused (Table 3). An estimated 268,746 acres burned, about 30.9 percent of the total subunit acreage. Thirty-eight of the fires were less than 10 acres; 11 fires ranged between 10 and 100 acres; three fires were between 100 and 1,000 acres; four fires were 1,000 to 5,000 acres, and eight fires greater than 5,000 acres occurred (Table 4). Twelve fires were never manned, including five of the seven fires over 5,000 acres (Class G).

Only 6 fires were reported for the Kaiyuh Mountains block, including two of the fires over 5,000 acres. Most of the fires in the Dulbi River block were scattered fairly randomly about the lower elevation land.

Fires started in 20 of the 27 years of record, with the most starts (7) reported in 1981, the result of May 31 thunderstorms. The greatest number of subunit acres burned in 1969, 164,000, with the second highest number in 1958, 29,460.

Ninety percent of all fires have started by July 23, and burned acreage resulting from the five August and September fires is negligible. However, in 1969, a large June fire was not out until October 10, and two late July, 1968, fires likely burned into the month of August.

Seventy thousand acres in the uplands near the south end of the subunit were burned by the 112,496 acre Dulbi No. 2 fire, which started June 21, 1956. Other fires were higher priority so no suppression action was taken.

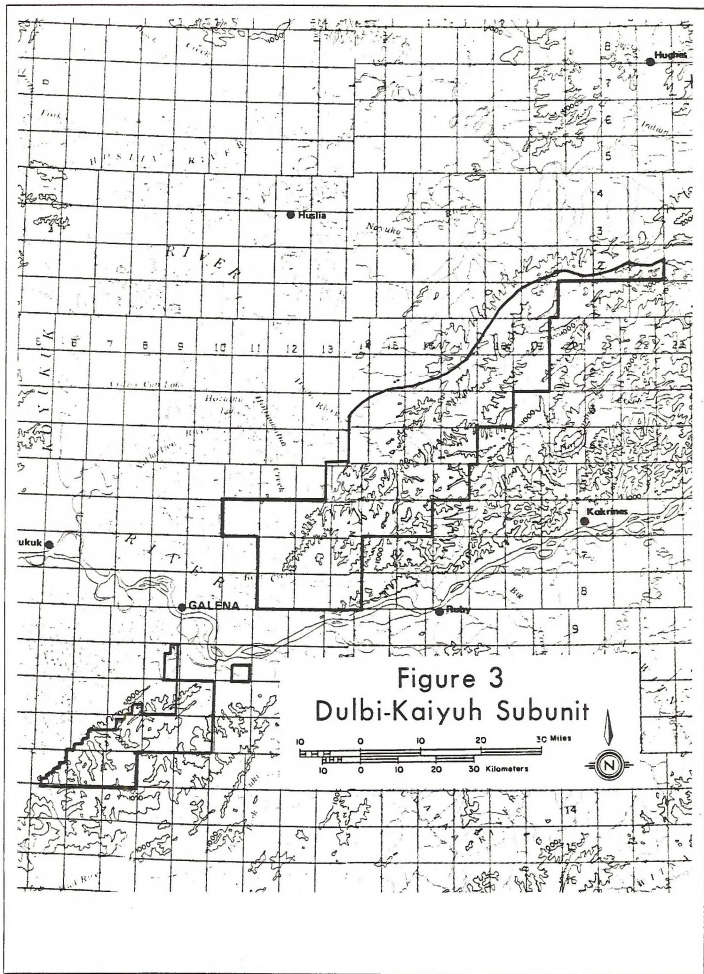


Figure 3
Dulbi-Kaiyuh Subunit

Table 3. FIRE OCCURRENCE: 1956-1982
Central Yukon Planning Area
DULBI-KAIYUH MOUNTAINS

Fire No.	Name	Date	Size Class	Acres in Subunit	Cause	Total Suppression Forces	Cost
003	Dulbi #1	6/12/56	F	2,560	Lightning	---	222
004	Dulbi #2	6/12/56	G	70,000	"	0	56
111	Dulbi	6/21/59	F	2,000	"	---	1,469
17	Mulato	5/17/60	B	5	Recreation	---	2,107
121	Kalakaker	7/21/60	B	2	Lightning	---	23
50	Dulbi River	6/20/63	C	10	"	---	823
42	Ruby 5-7	6/29/64	B	4	"	---	1,314
47K	Bald Fire	6/28/65	C	14	"	---	525
48K	Dulbi River	6/28/65	C	17	"	---	2,102
49K	Galena N14	6/28/65	C	55	"	---	816
238	Kelly	6/08/66	B	1	"	---	720
0C8	Mueller Mt.	8/14/66	C	20	Recreation	---	1,940
Y22	Dulbi River	5/30/67	C	11	Lightning	---	2,690
Y83	Turnaround	7/09/68	E	400	"	---	56,970
Y85	Bleak Spot	7/09/68	F	2,600	"	---	83,710
Y86	Dulbi River	7/09/68	D	160	"	---	32,000
285	Sheets Creek	7/23/68	G	7,000	"	---	29,700
9D6	Khotol Mt.	7/26/68	G	15,300	"	0	0
1E3	Base Line	7/30/68	G	4,000	"	0	0
9486*	Bear	6/21/69	G	150,000	"	236	281,730
9488	Mueller	6/21/69	G	2,000	"	0	4,830
9487	Thirsty	6/21/69	F	2,000	"	---	2,880
9546	Dulbi	7/02/69	G	12,000	"	0	400
9587	Turnaround Cr.	7/02/70	B	1	"	---	5,720
8623	Fox Cr.	6/22/71	C	30	"	---	8,998
8667	Bear Cr.	6/23/71	B	8	"	---	4,850
8676	Mel 1	6/23/71	A	0**	"	---	6,966
8677	Mel 2	6/23/71	B	2	"	---	2,226
8780	England	6/24/71	G	300	"	175	317,689
8560	Faith	6/15/72	A	0	"	---	189
8561	Charity	6/15/72	B	1	"	---	476
8568	Hope	6/15/72	B	2	"	---	111
8581	Mueller Mt.	6/16/72	A	0	"	---	806
8921	Khotol	8/07/72	A	0	"	---	771
8606	Zitna	7/02/73	B	4	"	---	177
8604	Table	6/21/74	A	0	"	0	3,970
8626	Melozzi	6/22/74	C	60	"	11	14,558
8638	Galena	6/22/74	B	1	"	4	12
8722	Kokrines	7/05/74	D	122	"	48	33,367
8760	Bald	7/16/74	B	2	"	0	189
8792	Dulbi II	8/03/74	C	10	"	4	1,941
8532	Bear	6/10/75	A	0	"	4	2,856
8661	Bald	7/19/75	A	0	"	2	1,712
8670	Fox	7/22/75	A	0	"	2	3,448
8671	Creek	7/22/75	B	2	"	0	0
8687	Radio	7/24/75	B	3	"	4	4,546
8566	Bear Creek	6/15/76	B	4	"	12	5,546
8684	Galena Mt.	7/23/76	B	2	"	2	2,753
8697	Melozitna	7/23/76	B	1	"	5	2,042
8698	Radio Cr.	7/23/76	A	0	"	0	993
8778	Khotol	8/26/76	B	1	Recreation	8	5,162
8816	Kinkaid Cr.	9/07/76	B	1	Lightning	4	3,341
8680	Dulbi	7/16/77	B	1	"	0	331
8687	Mueller	7/16/77	B	2	"	11	3,199
8850	Bear Creek	7/25/77	A	0	"	4	5,545
8873	Dulbi River	7/27/77	B	2	"	11	3,869
8514	GAL NE 55	5/31/81	C	10	"	11	3,521
8515	GAL NE 43	5/31/81	B	1	"	2	3,603
8517	GAL N 15	5/31/81	A	0	"	0	0
8518	St. 142004	5/31/81	B	2	"	2	599
8519	GAL NE 54	5/31/81	B	1	"	2	728
8520	GAL NE 56	5/31/81	C	13	"	12	15,299
8521	GAL NE 15	5/31/81	A	0	"	0	544
8687	GAL NE 22	7/11/82	A	0	"	2	2,191

* Started outside subunit boundary.

** Fires less than 1/4 acre are recorded as 0 acres in the computerized fire statistics.

Table 3. FIRE OCCURRENCE: 1956-1982
 Central Yukon Planning Area
 DULBI-KAIYUH MOUNTAINS

Fire No.	Name	Date	Size Class	Acres in Subunit	Cause	Total Suppression Forces	Cost
003	Dulbi #1	6/12/56	F	2,560	Lightning	--	222
004	Dulbi #2	6/12/56	G	70,000	"	0	36
111	Dulbi	6/21/59	F	2,000	"	--	1,469
17	Nulato	5/17/60	B	5	Recreation	--	2,107
121	Kalakaket	7/21/60	B	2	Lightning	--	23
50	Dulbi River	6/20/63	C	10	"	--	823
42	Ruby 5-7	6/29/64	B	4	"	--	1,314
474	Bald Fire	6/28/65	C	14	"	--	525
48K	Dulbi River	6/28/65	C	17	"	--	2,102
49K	Galena N14	6/28/65	C	55	"	--	816
238	Kelly	6/08/66	B	1	"	--	720
0C8	Mueller Mt.	8/14/66	C	20	Recreation	--	1,940
Y22	Dulbi River	5/30/67	C	11	Lightning	--	2,690
Y83	Turnaround	7/09/68	E	400	"	--	56,970
Y85	Bleak Spot	7/09/68	F	2,600	"	--	83,710
Y86	Dulbi River	7/09/68	D	160	"	--	32,000
285	Sheets Creek	7/23/68	G	7,000	"	--	29,700
9D6	Khotol Mt.	7/26/68	G	15,300	"	0	0
LE3	Base Line	7/30/68	G	4,000	"	0	0
9486*	Bear	6/21/69	G	150,000	"	236	281,730
9488	Mueller	6/21/69	G	"	"	0	4,830
9487	Thirsty	6/21/69	F	2,000	"	--	2,880
9546	Dulbi	7/02/69	G	12,000	"	0	400
9587	Turnaround Cr.	7/02/70	B	1	"	--	5,720
8623	Fox Cr.	6/22/71	C	30	"	--	8,998
8667	Bear Cr.	6/23/71	B	8	"	--	4,850
8676	Mel 1	6/23/71	A	0**	"	--	6,966
8677	Mel 2	6/23/71	B	2	"	--	2,226
8780	England	6/24/71	G	300	"	175	317,689
8560	Faith	6/15/72	A	0	"	--	189
8561	Charity	6/15/72	B	1	"	--	476
8568	Hope	6/15/72	B	2	"	--	111
8581	Mueller Mt.	6/16/72	A	0	"	--	806
8921	Khotol	8/07/72	A	0	"	--	771
8606	Zitna	7/02/73	B	4	"	--	177
8604	Table	6/21/74	A	0	"	0	3,970
8626	Melosi	6/22/74	C	60	"	11	14,558
8638	Galena	6/22/74	B	1	"	--	4
8722	Kokrines	7/05/74	D	120	"	48	33,367
8760	Bald	7/16/74	B	2	"	0	189
8792	Dulbi II	8/03/74	C	10	"	4	1,941
8532	Bear	6/10/75	A	0	"	4	2,856
8661	Bald	7/19/75	A	0	"	2	1,712
8670	Fox	7/22/75	A	0	"	2	3,448
8671	Creek	7/22/75	B	2	"	0	0
8687	Radio	7/24/75	B	3	"	4	4,546
8566	Bear Creek	6/15/76	B	4	"	12	5,546
8684	Galena Mt.	7/23/76	B	2	"	2	2,753
8697	Melozitna	7/23/76	B	1	"	5	2,042
8698	Radio Cr.	7/23/76	A	0	"	0	993
8778	Khotol	8/26/76	B	1	Recreation	8	5,162
8816	Kinkaid Cr.	9/07/76	B	1	Lightning	4	3,341
8680	Dulbi	7/16/77	B	1	"	0	331
8687	Mueller	7/16/77	B	2	"	11	3,199
8850	Bear Creek	7/25/77	A	0	"	4	5,545
8873	Dulbi River	7/27/77	B	2	"	11	3,869
8514	GAL NE 35	5/31/81	C	10	"	11	3,521
8515	GAL NE 43	5/31/81	B	1	"	2	3,603
8517	GAL N 15	5/31/81	A	0	"	0	0
8518	St. 142004	5/31/81	B	2	"	2	599
8519	GAL NE 54	5/31/81	B	1	"	2	728
8520	GAL NE 56	5/31/81	C	13	"	12	15,299
8521	GAL NE 15	5/31/81	A	0	"	0	544
8687	GAL NE 22	7/11/82	A	0	"	2	2,191

* Started outside subunit boundary.

** Fires less than 1/4 acre are recorded as 0 acres in the computerized fire statistics.

Table 4. FIRE STATISTICS SUMMARY: 1956-1982
Central Yukon Planning Area
DULBI-KAIYUH MOUNTAINS SUBUNIT

	Number of Fires	Number of Fires by Size Class*/ No. of Unmanned Fires								Acres in Subunit	Total Cost	Cost in 1967 Dollars	Cost in 1982 Dollars
		A	B	C	D	E	F	G	G**				
1956	1						1	1/1	72,560	278	330	954	
1957	0												
1958	0												
1959	1						1		2,000	1,469	1,683	4,866	
1960	2		2						7	2,130	2,401	6,941	
1961	0												
1962	0												
1963	1			1					10	823	897	2,593	
1964	1		1						4	1,314	1,414	4,088	
1965	3			3					86	3,443	3,643	10,532	
1966	2		1	1					21	2,660	2,737	7,913	
1967	1			1					11	2,690	2,690	7,777	
1968	6				1	1	1	3/2	29,460	202,380	194,223	561,499	
1969	4						1	2/2	164,000	289,840	263,971	763,140	
1970	1		1						1	5,720	4,918	14,218	
1971	5		1	2	1			1	340	340,729	280,898	812,076	
1972	5		3	2					3	2,353	1,878	5,429	
1973	1			1					4	177	133	385	
1974	6		1/1	2/1	2	1			193	54,037	36,586	105,770	
1975	5		3	2/1					5	12,562	7,793	22,530	
1976	6		1/1	5					9	19,837	11,635	33,637	
1977	43		1	3/1					5	12,944	7,123	20,619	
1978	0												
1979	0												
1980	0												
1981	7		2/2	3	2				27	24,294	8,919	25,785	
1982	1		1						0	2,191	758	2,191	
Total	64		13	25	11	2	1	4	7	1	268,746	834,572	2,412,943
Unmanned	12		4	3	0	0	0	0	5	0			

* A = 0-0.25 acres, B = 0.26-9 acres, C = 10-99 acres, D = 100-299 acres, E = 300-999 acres, F = 1000-4999 acres, G = 5000+ acres.

** Fires greater than 5,000 acres which started outside the subunit boundary, but burned acreage within the subunit.

Three Class G fires started in late July, 1968 (Appendix B). The Sheets Creek (#285), Khotol Mountain (#9D6), and Baseline (#1E3) fires burned 7,000, 15,300, and 8,000 acres respectively, and went out with little or no suppression action. Sheets Creek and Baseline burned entirely within the Dulbi block. However, the Khotol Mountain fire started near the border of the Kaiyuh Mountains block and it is not known how many subunit acres burned, because the fire report is not available. The 28,000 acre England fire burned between June 24 and July 7, 1971, when it was contained after a major suppression effort. Most of the burned acreage was in the lowlands of the Innoko Wildlife Refuge, and only about 300 acres of the Kaiyuh Mountains block burned.

The 442,000 acre Bear fire (#9486) and 90,000 acre Mueller fire (#9488) both started on June 21, 1969, and burned together on July 4. The Mueller fire was never attacked, but a total of 236 people manned the Bear fire until mid-July. The fire was demanned due to its low priority, and re-manned in September. Together, these fires burned about 150,000 acres in the southwest part of the Dulbi block, in the Bear Creek drainage to the east of Galena, and lands to the north.

The July 2, 1969 Dulbi fire was declared out on July 7 at 12,000 acres, when it burned into the 140,000 acre Cottonwood fire (#9545). The Cottonwood fire started in what is now the Koyukuk Wildlife Refuge, and was declared out August 1. This fire may have burned acres in the Dulbi block, but this cannot be determined, because no fire map is available.

Hughes Subunit

The Hughes subunit, covering about 1,911,918 acres, is located in the northwestern part of the planning area, on both sides of the middle part of the Koyukuk River (Figure 4). It extends from the Pah River Flats in the northwest to the upper Melozitna River to the southeast.

Eighty-three fires (82 lightning caused) have been reported for the period 1956-1982 (Table 5). Almost 29 percent of the area, about 554,000 acres, has burned. Fires have occurred in 23 of the past 27 years, with the highest burned acreage in 1969. Fires have been distributed fairly even throughout the subunit, as there are no large areas where fire is limited by topography or sparse fuels.

Forty-seven fires were reported which were less than 10 acres; 16 fires were between 10 and 100 acres; nine fires ranged between 100 and 1,000 acres; three fires from 1,000 to 5,000 acres occurred; and there were eight fires which were larger than 5,000 acres (Table 6). At least 18 of the 83 reported fires were never manned. Eight fires went out at less than one acre, and seven fires were less than 30 acres.

All fires but two have started in June and July, with July having the highest monthly total of 53. Most fire activity is over by the end of July, except in 1957, 1969, and 1977, when fires burned throughout August or until early September. Large fires occurred in these years and in 1981, with 70 percent of the total burned acreage occurring in 1969.

The 1957 fire on the Upper Melozitna (#169) started on July 20 and burned 22,680 acres, about 14,400 in the subunit by the end of August. No suppression action was taken on this fire, nor on the two large 1969 fires.

Figure 4
Hughes Subunit

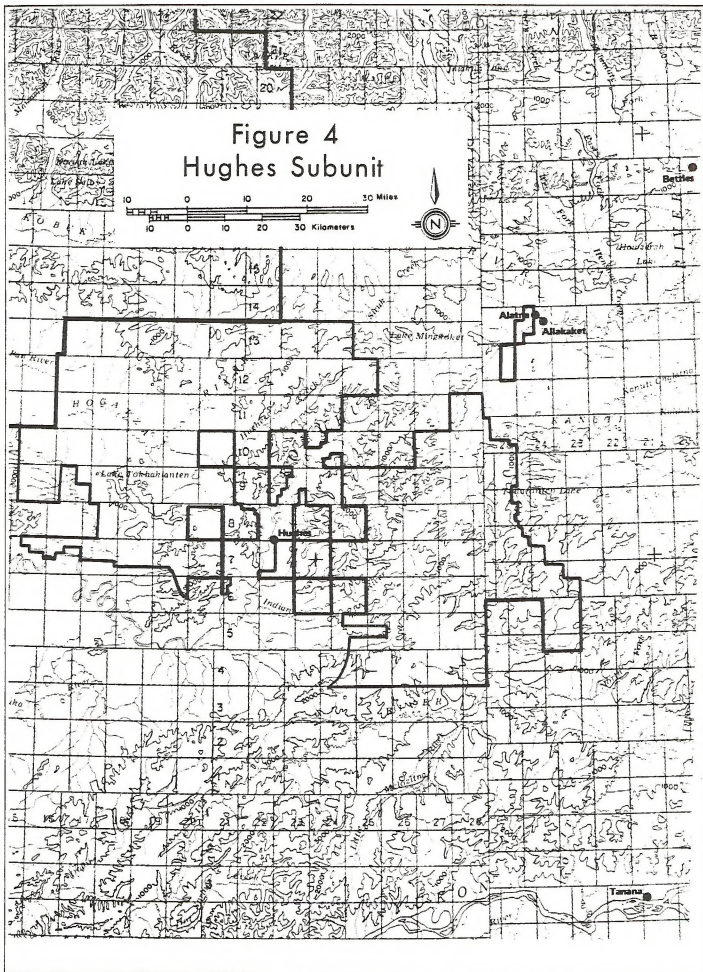


Table 5. FIRE OCCURRENCE: 1956-1982
Central Yukon Planning Area
HUGHES

Fire No.	Name	Date	Size Class	Acres in Subunit	Cause	Total Suppression	
						Forces	Cost
46	Mental Lake	6/15/56	F	1,200	Lightning	--	1,942
115	Meloz Cabin	7/21/56	C	80	"	0	0
169	Upper Melozitna	7/20/57	G	14,400	"	0	25
30	Melozitna Cabin	6/01/58	C	40	"	0	0
63	Red Mountain	6/20/59	D	100	"	0	0
203	Hog River	6/30/59	E	400	"	--	3,309
208	Hughes	7/01/59	C	15	"	0	0
227	Indian Mt.	6/30/59	C	10	Misc.	0	0
57	Mentanontli	6/08/60	C	51	Lightning	--	3,518
34	Utopia #1	7/18/62	B	3	"	--	379
35	Utopia #6	7/18/62	B	1	"	--	637
41	Utopia #7	7/18/62	B	1	"	--	614
53	Hogatza	7/20/62	C	50	"	--	10,401
68	Portage	7/24/64	B	5	"	--	1,062
75	Twin Lakes	7/24/64	C	14	"	--	1,715
76	Hills	7/24/64	B	2	"	0	44
Z44	Ray	6/22/66	C	15	"	--	990
LE5	Utopia	7/31/68	C	10	"	--	19,960
9468	Todatonten	6/19/69	F	3,000	"	--	800
9482*	Holonada Creek	6/21/69	G	356,540	"	--	450
9491	Crooked Creek	7/22/69	F	1,000	"	--	16,710
9498	Sithdonit	6/22/69	G	7,800	"	0	0
9551	Pingos	7/03/69	D	100	"	0	0
9592	Winter	7/02/70	B	1	"	--	1,270
9598	Caribou Creek	7/02/70	B	1	"	--	1,510
9599	Baba	7/02/70	B	1	"	--	280
9600	Ida Doo	7/02/70	B	7	"	--	2,070
9595	Kokhlia	7/03/70	E	800	"	--	114,950
9644	Blitz	7/04/70	B	2	"	0	260
9649	Todd Lake	7/04/70	B	5	"	0	1,190
9928	Mt. George	7/04/70	A	0**	"	0	0
8615	Holiday Creek	6/22/71	C	15	"	--	211
8616	Arctic Circle	6/22/71	A	0	"	--	718
8778	Hogh	6/29/71	B	4	"	--	8,462
8627	Menta River	7/02/72	C	30	"	--	5,173
8636	Kikhila	7/02/72	A	0	"	--	433
8673*	Pah River	7/08/72	G	42,240	"	14	29,171
8815*	Bridge	7/13/72	G	17,920	"	1	75,861
8591	Eleven Mile	7/01/73	E	650	"	--	239,586
8594	Airport	7/01/73	B	3	"	--	2,158
8600	Koy	7/02/73	C	10	"	--	5,584
8615	Yeager	7/03/73	B	9	"	--	4,040
8616	Pah	7/03/73	A	0	"	--	2,179
8603	Fish Camp	6/21/74	B	1	"	4	211

Table 5. HUGHES, Continued

Fire No.	Name	Date	Size Class	Acres in Subunit	Cause	Total Suppression	
						Forces	Cost
8640	Red	6/22/74	C	50	"	12	48,861
8653	Base	6/22/74	C	13	"	6	3,490
8655	McTighe	6/22/74	A	0	"	0	289
8660	Lookout	6/23/74	D	150	"	0	542
8704	Huggins	6/25/74	B	2	"	9	8,911
8816	Totatoden	8/05/74	B	3	"	4	4,398
8529	Spring	6/10/75	E	500	"	84	100,580
8634	Hogatza	7/14/75	B	5	"	8	8,113
8663	Hughes Cr.	7/22/76	B	0	"	9	8,479
8672	Batza River	7/23/76	C	21	"	24	18,993
8694	Birch Creek	7/23/76	B	2	"	2	7,270
8695	Sled Trail	7/23/76	A	0	"	2	1,796
8809	Hogatza	7/23/77	B	7	"	2	462
8854	BTT SW 60	7/25/77	B	7	"	7	3,862
8855	BTT SW 50	7/25/77	A	0	"	4	79
8858	BTT SW 69	7/25/77	A	0	"	11	4,823
8889	Pah River	7/30/77	G	45,760	"	92	252,217
8611	UTO E 8	7/14/78	A	0	"	4	566
8609	TAL NW 90	7/14/78	D	115	"	14	27,888
8702	TAL N 42	9/04/78	B	3	"	4	5,727
8546	DKC SE 52	6/06/79	C	30	"	36	26,612
8598	DKC SE 80	6/07/79	D	56	"	56	76,127
8629	DKC SE 83	6/08/79	B	0	"	2	1,157
8645	DKC SE 82	6/09/79	B	1	"	3	716
8567	Dry Creek	7/18/80	B	8	"	4	24,133
8568	Six Mile	7/18/80	B	3	"	6	10,079
8569	Winthrop	7/18/80	B	4	"	1	10,157
8572	Big Creek	7/18/80	B	2	"	0	1,850
8578	Gukhzna	7/18/80	B	0	"	0	650
8579	Round Mt.	7/18/80	A	0	"	0	0
8588	Hogatza	7/20/80	B	4	"	0	3,268
8590	Bakat Mt.	7/22/80	B	5	"	4	11,663
8576	HUS NW 10	6/14/81	B	5	"	9	17,812
8626	TAL NW 38	6/18/81	G	28,800	"	57	105,378
8620	Todatonten	6/18/81	G	11,560	"	161	475,898
8676	BTT SW 47	7/09/82	A	0	"	0	0
8663	DKC SE 70	7/09/82	D	125	"	35	56,519
8681	DKC SE 70	7/10/82	A	0	"	0	0
8714	DKC SE 105	7/14/82	A	0	"	4	5,421

* Started outside subunit boundary.

** Fires less than 1/4 acre are recorded as 0 acres in the computerized fire statistics.

Table 6. FIRE STATISTICS SUMMARY: 1956-1982
Central Yukon Planning Area
HUGHES SUBUNIT

	Number of Fires	Number of Fires by Size Class*/ No. of Unmanned Fires								Acres in Subunit	Total Cost	Cost in 1967 Dollars	Cost in 1982 Dollars
		A	B	C	D	E	F	G	G**				
1956	2			1/1						1,280	1,942	2,304	6,611
1957	1							1/1		14,400	25	30	87
1958	1			1/1						40	0		
1959	4			2/2	1/1	1				525	3,309	3,790	10,957
1960	1			1						51	3,518	3,966	11,466
1961	0												
1962	4		3	1						55	12,031	13,279	38,390
1963	0												
1964	3		2/1	1						21	2,821	3,037	8,780
1965	0												
1966	1			1						15	990	1,019	2,946
1967	0												
1968	1			1						10	19,960	19,155	55,377
1969	5				1/1		2	1/1	1/1	388,440	17,735	16,152	46,695
1970	8	1/1	6			1				817	121,530	104,497	302,101
1971	3	1	1	1						19	9,391	7,742	22,382
1972	4	1		1				2		60,190	1,110,638	886,383	2,562,533
1973	5	1	2	1		1				672	253,547	190,494	550,718
1974	7	1/1	3	2	1/1					219	66,702	45,160	130,558
1975	2		1			1				505	108,693	67,427	194,931
1976	4	1	2	1						23	36,538	21,430	61,954
1977	5	2	2					1		45,774	261,443	144,046	416,437
1978	3	1	1		1					118	34,181	17,493	50,572
1979	4	2	1	1						87	104,612	48,120	139,115
1980	8	1/1	7/3							26	61,800	25,041	72,394
1981	3		1					2		40,365	599,088	219,930	635,818
1982	4	3/1	1							125	61,940	21,425	61,940
Total	83	13	34	16	5	4	3	5	3	553,777		1,861,920	5,382,762
Unmanned	18	4	4	4	3	0	0	2	1				

* A = 0-0.25 acres, B = 0.26-9 acres, C = 10-99 acres, D = 100-299 acres, E = 300-999 acres, F = 1000-4999 acres, G = 5000+ acres.

** Fires greater than 5,000 acres which started outside the subunit boundary, but burned acreage within the subunit.

The Holonada Creek (#9482) fire burned 803,470 acres, about 357,000 in the subunit, from the Koyukuk River near Shannon Hill, south to Indian Mountain, and southeast to the Upper Melozitna River. The rest of its burned acreage was in the Tozitna subunit and the Kanuti National Wildlife Refuge. The only information reported about this fire is that it started on June 21, was declared out on September 23, and that several other fires burned into it. Only \$830 was charged to this fire. A fire map was not included in the fire report, so the perimeter location was approximated from a winter Landsat scene and from the known locations of smaller fires which burned into it. The 7,800 acre Sithdonit fire (#9498) burned into the Holonada Creek fire in early July.

The Pah River fire (#8763) started on July 8, 1972, burning about 42,240 acres in the subunit in the southeast Pah River Flats and on the west side of the Hogatza River. Fourteen people manned the southern perimeter of the fire near Hogatza. Over one million dollars (1972) was spent on the Bridge fire which burned 243,000 acres north of the Kanuti River, including about 18,000 acres in the subunit.

The 1977 Pah River fire (#8889) burned almost 43,000 of its total 56,640 acres in the northwest part of the subunit. Initial attack was made on this July 30 fire, but it was then demanned until August 20. Five thousand acres burned in early September, but 24 hours of rain beginning September 6 ended the fire activity. A total of 92 firefighters were assigned to #8889.

TAL NW 38 (#8626) began on June 18, 1981, and received suppression action until the 19th, when it was demanned because an adequate number of crews could not be assigned to the fire. From June 27 until July 7, patrol and mop-up action took place. The fire was left at patrol status because mop-up in a peat bog was not cost effective. The fire burned 32,000 acres, almost 29,000 in the subunit in the upper Melozitna drainage, just west of the Ray Mountains. The July 18, 1981 Todatonten fire (#8620) burned about half of its 21,000 acres on BLM land south of the Kanuti Canyon. First attack was made three days after the fire started and control was achieved on June 30 with the aid of rain. 161 people worked that fire.

Tozitna Subunit

The 1,593,051 acres of the Tozitna subunit lie along the Tozitna River to the north of the Yukon River and a ridge of unnamed hills, and include the Ray Mountains and north facing slopes south of the Kanuti Wildlife Refuge (Figure 5). Seventy-five fires, all lightning caused (Table 7), have been reported for the Tozitna subunit in the years 1956-1982. Approximately 374,712 acres have burned representing about 23.52 percent of the total area. Fires occurred in 20 of the past 27 years (Table 8). Only one fire less than 10 acres was reported for the first 15 years of record, but 34 were located in the last 12 years. Many more fires probably occurred in the early years, but were never detected because of limited amounts of aircraft use and fire detection in the area.

During the period of record, 37 reported fires were less than 10 acres; 21 fires were 10 to 100 acres; 10 fires were 100 to 1,000 acres; two were between 1,000 and 5,000 acres; and five fires greater than 5,000 acres occurred (Table 8). At least 15 of these fires were not manned. No suppression action occurred on three of the five Class G fires.

All but three fires started in June (36) and July (36), with most fires starting and burning between the second week of June and third week of July. However, the large fires in 1969 and 1977 burned into September.

Figure 5
Tozitna Subunit

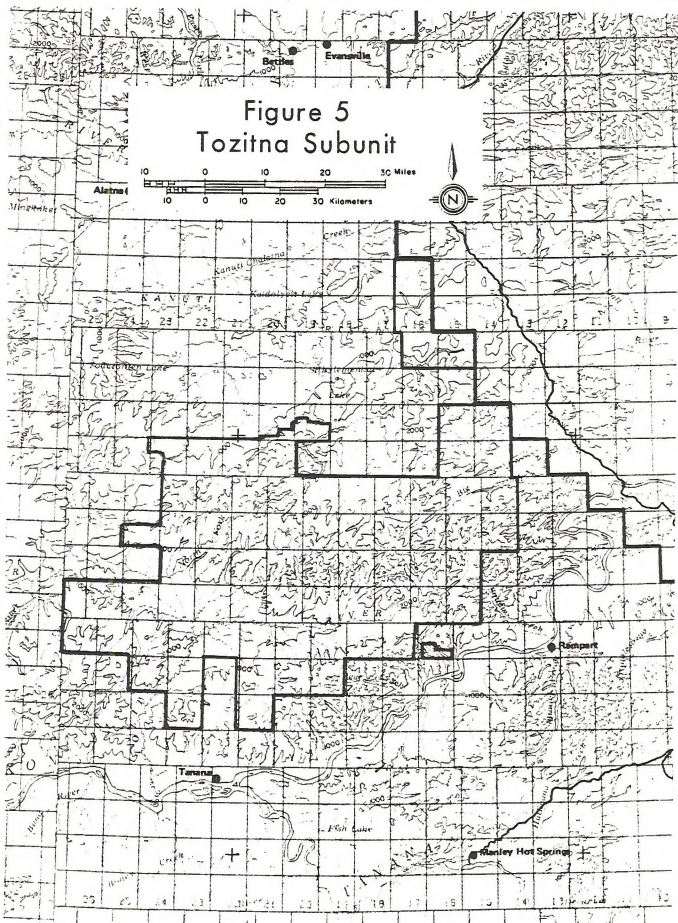


Table 7. FIRE OCCURRENCE: 1956-1982
Central Yukon Planning Area
TOZITNA

Fire No.	Name	Date	Size Class	Acres in Subunit	Cause	Total Suppression	
						Forces	Cost
48	Ray Mtn. #1	6/16/56	E	450	Lightning	--	978
67	Ray Mtn. #3	6/17/56	C	45	"	0	0
68	Ray Mtn. #4	6/17/56	C	95	"	0	0
107	Squaw Creek 2	7/26/56	C	40	"	--	555
37	Indian River	6/02/58	C	40	"	--	703
42	Tozitna #1	7/14/58	D	110	"	--	6,250
58	Tozitna #2	6/04/58	C	50	"	--	275
104	Tozitna	7/06/58	D	300	"	--	5,061
184	Ray River	6/28/59	D	250	"	0	0
199	Mac Roadhouse	7/01/59	B	3	"	0	0
232	Caribou Mtn.	7/10/59	D	100	"	0	0
39	Tozitna	6/29/61	C	20	"	--	313
33	Hellbent #1	6/18/64	C	27	"	--	2,544
252	Ptarmigan	8/04/66	C	33	"	--	1,710
232	Morlook	7/20/68	C	12	"	--	9,280
253	Kilo Hot Springs	7/23/68	D	175	"	--	6,577
9482*	Holonada Cr.	6/21/69	G	112,640	"	0	450
9493	Hellbent	6/22/69	E	500	"	0	1,420
9499	Ray Mtn.	6/22/69	G	8,800	"	0	620
9479	Reindeer Creek	6/21/69	G	214,560	"	0	1,110
9513*	Ridgetop	6/23/69	G		"	233	389,650
8588	Bandana Creek	6/21/71	B	4	"	--	5,396
8612	Sit Lake	7/01/72	C	13	"	--	12,318
8638	McQuesten	7/02/72	B	2	"	--	3,016
8735	Crooked Creek	7/11/72	C	40	"	--	12,649
8736	Marva	7/11/72	E	800	"	--	17,345
8737	Gisha	7/11/72	D	225	"	--	18,931
8739	Straight Creek	7/11/72	F	2,700	"	--	33,454
8757	Fleshlanana	7/12/72	B	1	"	--	1,443
8769	Big Salt	7/12/72	C	20	"	--	16,870
8879	Holonada Creek	7/23/72	B	2	"	--	4,378
8524	Crash	6/11/73	A	0**	"	--	468
8549	Bear	6/20/73	A	0	"	--	957
8570	Spook	6/30/73	B	5	Misc.	--	6,815
8576	Ray	7/01/73	B	8	Lightning	--	4,162
8581	Wells	7/01/73	C	80	"	--	30,504
8569	Sneezy	6/19/74	C	11	"	2	200
8570	Doc	6/19/74	B	3	"	2	4,124
8571	Dopey	6/19/74	B	1	"	2	202
8572	Grumpy	6/19/74	B	1	"	2	413
8573	Happy	6/19/74	A	0	"	2	215
8574	Bashful	6/19/74	B	1	"	4	4,091
8575	Droopy	6/19/74	B	3	"	2	269
8595	Sno White	6/21/74	F	3,200	"	--	129,344

Table 7. TOZITNA (continued)

Fire No.	Name	Date	Size Class	Acres in Subunit	Cause	Total	
						Suppression Forces	Cost
8617	Trouble	6/21/74	B	2	"	2	165
8624	Hasty	6/22/74	C	50	"	0	2,773
8645	Base	6/22/74	C	75	"	0	0
8855	Big Salt	8/07/74	B	0	"	2	1,905
8611	TAL N 26	7/13/75	A	0	"	4	2,108
8612	TAL N 27	7/13/75	A	0	"	4	24
8614	Bandana 1	7/13/75	A	0	"	0	1,815
8630	Biscuit	7/13/75	B	1	"	2	2,450
8694	TAL N 45	7/13/75	B	4	"	4	13,026
8664	TAL N 35	7/22/76	C	20	"	8	7,945
8669	TAL DE 65	7/23/76	B	2	"	0	2,833
8714	TAL NE 47	7/17/77	D	200	"	6	5,993
8739	TAL N 45	7/18/77	C	35	"	39	17,395
8740	TAL N 38	7/18/77	C	25	"	13	6,732
8762	TAL N 32	7/22/77	B	4	"	11	6,379
8768	TAL NW 29	7/22/77	A	0	"	5	1,803
8823*	BTT SE 47	7/24/77	G	28,880	"	142	228,477
8599	TAL N 22	7/11/78	B	1	"	4	12,461
8608	TAL N 50	7/14/78	B	1	"	2	880
8635	TAL NE 30	7/25/78	B	1	"	2	4,758
8509	BTT SE 47	5/24/79	A	0	"	0	2,878
8543	Reindeer #1	6/06/79	C	12	"	10	8,102
8559	TAL N 14	6/06/79	B	2	"	6	2,719
8637	TAL N 24	7/09/79	A	0	"	0	0
8639	TAL N 46	6/09/79	A	1	"	2	12,234
8658	FAI NW 97	6/30/79	B	3	"	--	1,573
8565	5 Mi. W 13	7/18/80	B	3	"	37	1,499
8566	5 Mi. W 14	7/18/80	C	20	"	3	23,684
8574	Allard Cr.	6/14/81	B	1	"	2	2,706
8575	Bandana	6/14/81	B	3	"	8	11,387
8562	Torment	6/27/82	B	4	"	5	7,756

* Started outside subunit boundary.

** Fires less than 1/4 acre are recorded as 0 in the computerized fire statistics.

Table 8. FIRE STATISTICS SUMMARY: 1956-1982
Central Yukon Planning Area
TOZITNA SUBUNIT

	Number of Fires	Number of Fires by Size Class*/ No. of Unmanned Fires								Acres in Subunit	Total Cost	Cost in 1967 Dollars	Cost in 1982 Dollars
		A	B	C	D	E	F	G	G**				
1956	4			3/2	1					630	1,533	1,819	5,259
1957	0								1/1				
1958	4			2	2					500	12,889	14,191	41,026
1959	3		1/1		2/2					353	0		
1960	0			1									
1961	1									20	313	349	1,009
1962	0			1									
1963	0												
1964	1		2/1	1						27	2,544	2,738	7,916
1965	0												
1966	1			1						33	1,710	1,759	5,085
1967	0												
1968	2			1	1					187	15,857	15,218	43,995
1969	5					1/1		1/1	3/2	336,500	391,605	356,653	1,031,084
1970	0												
1971	1		1							4	5,396	4,448	12,859
1972	9		3	3	1	1	1			3,803	120,404	96,093	277,805
1973	4		2	2	1					93	42,906	32,236	93,194
1974	12		1	7	3/2					3,347	143,701	97,292	281,271
1975	5		3/1	2						5	19,423	12,049	34,834
1976	2		1/1	1						22	10,778	6,321	18,274
1977	6		1	1	2	1			1	29,144	38,302	21,103	61,009
1978	3			3						3	18,099	9,263	26,779
1979	5		3/2	2	1					18	27,506	12,652	36,577
1980	2			1	1					23	25,183	10,204	29,500
1981	3			2						4	14,093	5,174	14,958
1982	1		1							4	7,756	2,683	7,757
Total	75	10	27	21	7	3	2	1	4	374,720		702,245	2,030,191
Unmanned	15	3	2	4	2	1	0	1	2				

* A = 0-0.25 acres, B = 0.26-9 acres, C = 10-99 acres, D = 100-299 acres, E = 300-999 acres, F = 1000-4999 acres, G = 5000+ acres.

** Fires greater than 5,000 acres which started outside the subunit boundary, but burned acreage within the subunit.

Fires have been scattered fairly evenly about the lowland areas of the subunit. No fires were reported for the higher elevations of the Ray Mountains. One concentration of 16 small fires is found along the southern part of the Tozitna River.

Four of the five project size fires, and almost 90 percent of the total subunit burned acreage occurred in 1969, with the other major fire in 1977. BTT SE 47 (#8823) received initial action on the same day it began, July 24, 1977. Forces were pulled off on July 30 and 31, because the fire could not be handled with the limited number of crews available. All major fire activity had ceased by the time the fire was remanned on August 26, and subsequently controlled on September 6.

Four major fires started between June 21 and June 23, 1969. The Holonada Creek fire (#9482) started just northwest of the Ray Mountains, and burned about 112,640 acres in the northern part of the subunit. The 8,800 acre Ray Mountain fire (#9499) burned into the Holonada Creek fire on July 2. Neither fire received suppression action.

The 251,520 acre Ridgetop fire (#9513) began on June 23, 1969. The 30,000 acre Reindeer Creek (#9479) fire burned into the Ridgetop fire on July 2. Together, these fires burned about 214,560 acres in the subunit, mainly in the lowlands in the central and eastern part of the Tozitna drainage, and in the uplands to the south. The only line building and mop-up action on these fires occurred on the southern edge to prevent spread toward the Yukon River and the village of Tanana. Rain began on July 9 and permitted a declaration of control on July 15.

Nineteen fires have started since 1969 within the perimeter of the Ridgetop fire. Four were between 10 and 80 acres, and the rest were less than 10 acres. One 225 acre fire may have burned in 1972 inside the fire boundary near its eastern border. Fire potential must still be fairly low in that burned area, except in isolated pockets of unburned vegetation.

North Kuskokwim Subunit

The 1,705,056 acre North Kuskokwim subunit is in the southcentral part of the planning area, south and southwest of the Yukon River near its junction with the Tanana, and bordering on the Anchorage District boundary to the south (Figure 6).

Fifty-seven fires, all caused by lightning, have affected BLM lands in this area in the period 1956-1982 (Table 9). 225,512 acres have burned, or 13.23 percent of the subunit. Thirty-three fires were less than 10 acres; 10 fires ranged from 10 to 100 acres; two fires were between 100 and 1,000 acres; there were two fires between 1,000 and 5,000 acres; and 10 fires 5,000 acres and larger occurred (Table 10). At least ten of these 57 fires were never manned, including five of the ten Class G fires. A major suppression effort was taken on only one Class G fire.

Fires have occurred throughout the area. However, only one large fire has occurred in the northern part of the subunit near the Chitanana River and Chitanatla Mountains. Only one Class G fire (6,400 acres) has started in the western part of the subunit lands on the Ruby map quad.

Figure 6
North Kuskokwim Subunit

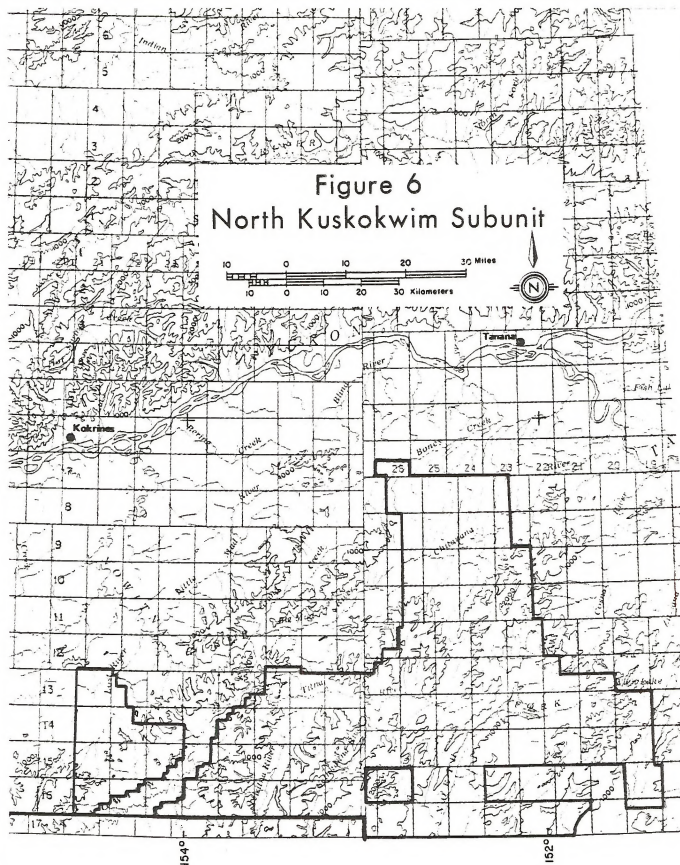


Table 9. FIRE OCCURRENCE: 1956-1982
 Central Yukon Planning Area
 NORTH FORK KUSKOKWIM

Fire No.	Name	Date	Size Class	Acres in Subunit	Cause	Total Suppression Forces	Cost
A23T	Itna	6/23/57	G	109,336	Lightning	0	144
39	Minchumina	6/18/58	G	30,000	"	---	4,693
24	Telaitna	6/05/59	C	51	"	---	12,837
57	Telaitna #2	6/19/59	F	2,000	"	---	16,365
242	Titna	6/22/59	B	9	"	0	0
21	Minchumina	7/18/62	C	12	"	---	6,281
44	Galtan	8/13/62	B	7	"	---	7,186
58A	Sultana River	6/20/63	C	12	"	---	3,289
84	Big Mud N 10	7/28/64	B	6	"	---	4,562
41K	Tanana S 40	6/27/65	C	25	"	---	351
227	Haystack	6/06/66	B	8	"	---	1,330
061	Haystack Mtn.	7/23/68	G	9,500	"	---	1,190
280	Redland Lake	7/23/68	G	18,240	"	---	17,700
288	Lawson Creek	7/23/68	C	16,640	"	---	2,560
909	American Creek	7/23/68	C	6,400	"	0	0
506	Deer Creek	8/08/68	B	3	"	---	17,630
9505	John Hansen	6/23/69	G	12,700	"	0	350
9552	Big Mud River	7/03/69	A	0**	"	---	1,520
9585	Lawson	7/14/69	G	5,000	"	0	1,080
9593	Boney	7/19/69	F	3,100	"	---	148,900
9637	Baker	9/19/69	G	5,000	"	0	480
8631	Wien Lake*	6/22/71	G	7,040	"	---	1,179,743
8706	Muddy River	6/24/71	B	5	"	---	4,260
8779	Kusk	6/29/71	B	2	"	---	4,491
8554	Blitz	6/15/72	B	1	"	---	4,011
8557	Mud River	6/15/72	C	15	"	---	2,549
8558	Haystack Mtn.	6/15/72	B	2	"	---	5,203
7630	Line Fire	7/01/72	B	3	"	---	6,596
7631	Sethkokna	7/01/72	A	0	"	---	4,614
8749	Jean	7/11/72	B	2	"	---	2,395
8750	Seth	7/11/72	B	5	"	---	670
8800	Redland Lake	7/13/72	D	150	"	---	8,710
8791	Telaitna River	7/19/72	D	100	"	---	2,303
8536	Stack	6/14/73	B	3	"	---	3,615
8560	Sethkokna	6/19/74	A	0	"	4	6,965
8667	Dot	6/23/74	B	3	"	9	2,985
7898	Raseac	8/04/74	B	2	"	---	1,004
8520	Minchumina	6/08/75	A	2	"	2	2,226
8638	TAL S 40	7/14/75	B	1	"	4	6,277
8640	TAL S 38	7/14/75	A	0	"	2	5,036
8565	Wien NW 40	6/15/76	A	0	"	2	4,295
8628	MHM NW 30	7/13/76	B	4	"	9	2,961
8660	MHM N 45	7/22/76	C	25	"	28	21,751
7763	Sulukna #1	7/22/76	A	0	"	---	854
8658	MHM NW 65	7/22/76	B	1	"	0	2,916
8766	TAL SW 115	8/11/76	C	15	"	9	5,246
8829	Rby SE 38	7/24/77	C	12	"	6	6,218
8905	MHM N 35	7/31/77	B	2	"	5	3,194
8906	TAL S 29	7/31/77	B	5	"	7	2,718
8907	MHM N 37	7/31/77	B	5	"	0	2,537
8659	Nowitna	6/30/79	B	0	"	9	997
7659	Telaitna	6/18/81	B	4	"	---	994
8623	Nearby	6/18/81	A	0	"	2	2,727
8615	TAL S 30	6/18/81	C	20	"	56	44,159
8632	Rby SE 43	6/19/81	C	35	"	8	7,184
8634	Rby SE 53	6/19/81	A	0	"	0	2,856
8639	California	6/20/81	B	1	"	11	3,540

* Started outside subunit boundary.

** Fires less than 1/4 acre are recorded as 0 acres in the computerized fire statistics.

Table 10. FIRE STATISTICS SUMMARY: 1956-1982
 Central Yukon Planning Area
 NORTH FORK KUSKOKWIM SUBUNIT

	Number of Fires	Number of Fires by Size Class*/ No. of Unmanned Fires								Acres in Subunit	Total Cost	Cost in 1967 Dollars	Cost in 1982 Dollars
		A	B	C	D	E	F	G	G**				
1956	0												
1957	1							1/1	109,366	144	170	491	
1958	1							1	30,000	4,693	5,419	15,666	
1959	3		1/1	1				1	2,060	29,202	33,450	96,704	
1960	0												
1961	0												
1962	2		1	1					19	13,467	14,864	42,972	
1963	1			1					12	3,289	3,587	10,370	
1964	1		1						6	4,562	4,911	14,198	
1965	1			1/1					25	351	371	1,073	
1966	1		1						8	1,330	1,368	3,955	
1967	0												
1968	5		1					4/1	50,783	39,080	37,505	108,427	
1969	5	1						1 3/3	25,800	152,330	138,734	401,080	
1970	0												
1971	3		2						7,047	1,188,494	979,797	2,832,593	
1972	9	1	5	1	2				278	37,051	29,570	85,487	
1973	1		1						3	3,615	2,716	7,852	
1974	3	1	2						5	10,954	7,416	21,440	
1975	3	2	1						1	13,539	8,399	24,282	
1976	6	2	2/1	2					45	10,954	6,425	18,575	
1977	4		3/1	1					24	14,667	8,081	23,362	
1978	0												
1979	1		1						0	997	459	1,327	
1980	0												
1981	6	2/1	2	2					60	61,460	22,563	65,227	
1982													
Total	57	9	24	10	2	0	2	9	1	225,542	1,305,805	3,775,081	
Unmanned	10	1	3	1	0	0	0	5	0				

* A = 0-0.25 acres, B = 0.26-9 acres, C = 10-99 acres, D = 100-299 acres, E = 300-999 acres, F = 1000-4999 acres, G = 5000+ acres.

** Fires greater than 5,000 acres which started outside the subunit boundary, but burned acreage within the subunit.

27 fires started in June, 25 in July, and 5 in August, with the peak of fire activity lasting from mid-June until the end of July. Large fires in 1957, 1969, and 1971 were not out until August or September. Four large fires in 1968 probably burned into August.

Fires have been reported in 19 of the last 27 years, and large fires have happened in five years (Appendix B). Only the 1971 Wien Lake fire was given project fire status. The biggest fire year was 1957, when one fire resulted in 50% of the total acreage burned in the subunit. The Itna fire (A 23T) burned 113,496 acres, mainly south of the Titna River between the North Fork Kuskokwim and Sethkokna Rivers. That June 23 fire was declared out on August 27, after burning about 109,336 acres in the subunit.

The May 30, 1958 Minchumina fire (#39) burned 30,000 acres in about two days, north of the North Fork Kuskokwim River and southwest of the Bitzshtini Mountains. It was then "knocked down by heavy rain." No fire reports are available for the four Class G fires in 1968. All four fires started between July 23 and July 26, and how long they burned or what suppression action was taken, is not known. Cost figures suggest that the 18,240 acre Redland Lake fire (#280) was the only fire in which any significant attack was made, but the \$17,700 cost could not have supported much continued action. The largest 1968 fire was the Haystack Mountain (#0E1), which burned 19,100 acres of BLM and Native selected land southwest of Haystack Mountain. The 16,640 Lawson Creek fire (#288) burned north of the Titna River near its junction with the Sethkokna River. The 6,400 acre American Creek fire (#9D9) occurred northeast of the Junction of the Titna River with the Nowitna.

Two 5,000 acre fires burned in 1969: Lawson (#9585), north of the Titna River and just north of the 1957 Itna fire; and Baker (#9637), in the uplands northwest of Sischu Mountain. 12,700 acres of a total of 38,400 acres burned on BLM lands in the John Hansen fire (#9505), southeast of Haystack Mountain. That June 23, 1969 fire was declared out on August 1.

The Wien Lake fire (#8631) started on June 22, 1971, and was controlled on July 17, 1971, after a major suppression effort. The fire burned north of Wien Lake and made a run northwest to the Cosna River, covering about 7,000 acres in the east part of the North Kuskokwim subunit. During the entire period of record, only one fire has been reported within the perimeter of another large fire, and that fire grew to only three acres before it was suppressed.

DISCUSSION

Relative Fire Activity

The subunits are of variable size, with different fuels and topographic composition, so direct comparisons of fire numbers, burned acres, and suppression costs cannot be made. Some averaging statistics have been calculated and are arrayed in Tables, 11, 12, and 13.

The East Nulato Hills subunit has the highest percent of area burned, 31.33 percent, and average fire size, 23,313 acres of all the subunits, because of the 1957 Kateel River fire (Table 11). Over one-third of all burned acres in the entire planning area resulted from that fire. Fire occurrence is very low, however, 1.4 starts/100,000 acres. The low fuel loading in much of the burned area, and the sparse or negligible fuels in

mountainous areas to the west cause a low percentage ignitions from lightning strikes and result in small fires when fuels are present. Also, many small fires may have started and gone out at a small size before detection.

The North Kuskokwim subunit has had an average number of fire starts for the planning area, but the percentage of area burned is quite low, 13.23 percent, about half of the planning area average (Table 11). There have been only two fires greater than 60,000 acres in the subunit vicinity, and one burned only 7,000 acres in the subunit (Appendix B). Of the eight remaining fires, none burned more than 38,000 acres. Most fires have not become extremely large as they frequently have in other parts of the planning area. This is not due to successful suppression effort because suppression costs were extremely low on all but two Class G fires. Whether the lack of larger fires is a function of fuels and topography, or just a random event caused by weather, is unknown. Several large fires for which there are no records have occurred in the southeast part of the North Kuskokwim unit near the Minchumina settlement area. However, large fires are not evident in most of the northern and western parts of the subunit.

The Dulbi-Kaiyuh Mountains subunit has 7.35 starts/100,000 acres, the highest of any subunit, and the second highest percentage of area burned. However, the average fire size is second lowest. Three fires greater than 15,000 acres have occurred, and these were in the area of most flammable country, in the southwest part of the Dulbi block. Four Class G fires remained small without suppression. The proximity of the area to Galena may allow detection of a higher percentage of fires, small fires which in other subunits go out without detection.

The Hughes and Tozitna subunits are adjacent and the fire statistics suggest that the pattern of fire occurrence is similar. They rank third and fourth in percent of area burned, 28.96 and 23.52, and second and third in average fire size, 6,672 and 4,996. Also both subunits had the majority of their burned acreage occur in 1969, including one fire that burned about 470,000 acres in the two subunits.

Fire seasonality

The timing of the fire season (Table 12) does not vary significantly throughout the planning area. There seems to be a bit more lightning activity early in the season in the Dulbi-Kaiyuh Mountains than in the other subunits, based upon the date when 60 percent of fires have begun. The peak of fire activity is last over in the North Kuskokwim subunit, but not significantly later than in other areas.

Fires starting in June contributed to 90 percent of total burned acreage in the East Nulato Hills and Tozitna, and 70 percent of the total burned acreage in other subunits. 90 percent of total burned acreage resulted from fires starting on July 9, July 20, and July 23, respectively, in the Dulbi-Kaiyuh Mountains, Hughes, and North Kuskokwim subunits.

Most thunderstorms in interior Alaska occur in June and July, with a peak from mid-June to mid-July (Grice and Comiskey, 1976). Most of these are air mass thunderstorms, caused by the convective lifting of heated parcels of air. Since almost all fires in the planning area are lightning caused, the

TABLE 11. FIRE STATISTICS SUMMARY
Central Yukon Planning Area
1956 - 1982

Unit and Approx. Acreage	# Fires*							Total # Fires Affecting Subunit	Light- ning Fires	% Light- ning	Estimated Acres Burned	Percent of Area Burned	Starts/ 100,000 Acres	Average Fire Size in Acres
	A	B	C	D	E	F	G							
East Nulato** Hills 2,492,800	3	11	10	3	3	3	2	35	30	85.7	780,951	31.33	1.40	22,313
Dulbi-Kaiyuh Mtns 870,814	13	25	11	2	1	4	8	64	61	95.31	268,746	30.86	7.35	4,199
Hughes + 1,911,918	13	34	16	5	4	3	8	83	82	98.80	553,777	28.96	4.34	6,672
Tozitna 1,593,051	10	27	21	7	3	2	5	75	74	98.67	374,720	23.52	4.71	4,996
North Kuskokwim 1,705,056	9	24	10	2	0	2	10	57	57	100.00	225,512	13.23	3.34	3,956
Central Yukon Area 8,573,639**	48	121	68	19	11	14	33	314	304	96.82	2,203,706	25.70	3.66	7,018

* A = 0-0.25 acres, B = 0.25-9 acres, C = 10-99 acres, D = 100-299 acres, E = 300-999 acres,
F = 1,000-4,999 acres G = 5,000+ acres

**Does not include eastern part Buckland HMP Area, nor small area isolated tract to north.

+ Does not include two isolated townships west of main block of subunit.

TABLE 12. FIRE SEASONALITY, BY SUBUNIT
 Central Yukon Planning Unit
 1956 - 1982

Subunit	<u>Lightning</u>		<u>Man-Caused</u>		Date When % of Fire					Dates When Fires Burning				
	Earliest Fire	Latest Fire	Earliest Fire	Latest Fire	Starts 60 %	Have 70 %	Occurred 80 %	90 %	% of Acres 60 %	Have 70 %	Begun 80 %	90 %		
Eastern Nulato Hills	6/06	8/06	5/18	8/11	7/8	7/16	7/23	7/26	6/10	6/10	6/10	6/10		
Dulbi-Kaiyuh Mountains	5/30	9/07	5/17	8/26	7/5	7/16	7/23	7/27	6/21	6/21	6/21	7/9		
Hughes	6/01	9/04	6/30	6/30	7/13	7/18	7/21	7/24	6/21	6/21	7/8	7/20		
Tozitna	5/24	8/07	6/30	6/30	7/11	7/13	7/18	7/24	6/23	6/23	6/23	6/23		
North Kuskokwim	6/05	9/19			7/14	7/19	7/23	7/31	6/23	6/23	7/23	7/23		

Table 13. FIRE COSTS, BY SUBUNIT
Central Yukon Planning Area
1956 - 1982

Subunit	Number of Fires	Subunit Acreage	Total Acreage Burned	% of Fires Not Manned	Adjusted Cost in 1967 \$\$\$	Adjusted Cost in 1982 \$\$\$	Cost per Fire (1982)**	Cost per Subunit Acre
East Nulato Hills*	35	2,492,800	780,951	17.14	194,636	562,694	16,077	0.23
Dulbi-Kaiyuh Mtns.	64	870,814	268,746	18.75	390,994	1,130,364	17,662	1.30
Hughes	83	1,911,918	553,777	21.69	945,319	2,732,916	32,927	1.43
Tozitna	75	1,593,051	374,720	20.55	539,837	1,560,669	20,809	0.98
North Kuskokwim	57	1,705,056	225,512	17.54	438,551	1,267,850	22,243	0.74
Central Yukon Planning Area	314	8,573,639	2,203,706	19.43	2,509,336	7,254,493	23,103	0.85

* Does not include the eastern part of the Buckland Basin, discussed in a separate report for the Northwest planning area.

**Costs have been adjusted for large fires that burned both on BLM and other agency lands. A percentage of total cost was used that is proportional to the percentage of the total burned acres that occurred on BLM administered lands.

period of the fire season is closely related to the period of maximum solar insolation. All but one of the Class G fires which burned into August or September resulted from June or July thunderstorms.

Fire suppression costs

Fire suppression cost was highest in the Hughes subunit, both in terms of average cost per fire, \$32,927, and cost per subunit acre \$1.43 (Table 13). Fire costs were by far the lowest in the East Nulato Hills Subunit, with an average fire cost of about half of that in Hughes, \$16,077, and a cost expended per subunit acre of about one-sixth, \$0.23. The fact that no major project fire actions occurred in East Nulato contributes significantly to the low costs. High costs on several project fires, as well as on many fairly small fires, caused the high dollar figure for the Hughes subunit.

The Tozitna subunit was median, both in terms of average cost per fire, \$20,809, and cost per subunit acre, \$0.98. The Dulbi-Kaiyuh Mountains and North Kuskokwim rank second or fourth in cost, depending on whether cost per fire, \$17,662 and \$22,243, or cost per subunit acre, \$1.30 and \$0.74, are considered. The great number of fires per unit area in the Dulbi block, resulted in high costs being distributed over a fairly small acreage, yielding a high cost per subunit acre. Cost per fire in the North Kuskokwim subunit was second highest, but still \$10,684 less than average fire cost in Hughes.

The percent of fires which were not manned (Table 13) did not differ very much among subunits, ranging from a low of 17.14 percent in the East Nulato to a high of 21.69 percent in the Hughes. The level of unmanned fires cannot be effectively used to explain major differences in fire costs.

PLANNING AREA SUMMARY

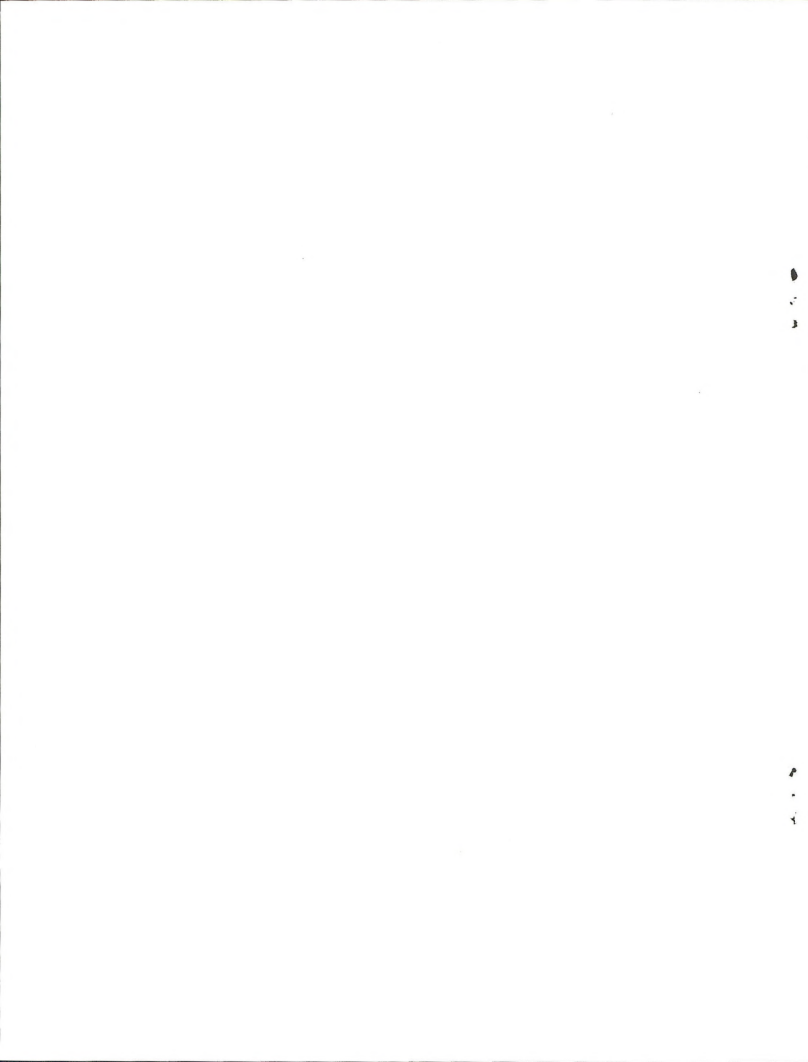
A total of 314 fires, 304 caused by lightning, have occurred in the years 1956-1982 on BLM lands in the Central Yukon Planning Area. 2,203,706 acres have burned, almost 26 percent of the total acreage considered in this analysis. Only 615 acres, about 0.03 percent of the total burned acreage has resulted from man-caused fires (Appendix C). The only fires to occur in the planning area before May 24 were man-caused. Fires occurred somewhere in the area every year, with the most starts in 1974, and the least number of reported fires in 1961 and 1967 (Table 14). Class G fires (greater than 5,000 acres) have occurred in 8 of the 27 years, with the greatest number of large fires in 1969, also the year with the greatest amount of burned acres.

An average of 3.66 fires have started per 100,000 acres, and the average fire size within the planning area was 7,018 acres. Average expenditure per fire was about \$23,103, and about \$0.85 was spent per subunit acre for fire suppression action.

Total yearly suppression costs varied from a high of \$2,933,295 in 1972, to a low of \$1,009 in 1961. Costs in 1969 were the second highest total. \$14.2 million was the total suppression expenditure for fires which burned acres within the planning area. However, when costs are adjusted to compensate for fires which burned acres on both sides of the planning unit boundary, an estimated \$7.3 million was spent on fire suppression within the borders of all planning subunits.

Literature Cited

- Grice, Gary K. and Albert L. Comiskey. 1976. Thunderstorm climatology of Alaska. NOAA Technical Memorandum NWS-AR-14. U.S. Dept. of Commerce. National Oceanic and Atmospheric Administration. National Weather Service, Regional Headquarters, Anchorage, Alaska. 36 pp.
- Miller, Melanie. 1985. Fire occurrence in the Northwest Planning Area: 1956-1982. BLM - Alaska Open File Report, Number 15, November 1985. 40 pp.



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